

NOTES ON GUNDLACHIA. I.

BY BRYANT WALKER.

The validity of the genus *Gundlachia* Pfr. is one of the disputed points in systematic conchology.

The article by Hedley, reprinted with notes by Dr. Pilsbry in the NAUTILUS in 1895 (Vol. IX, p. 61), gives a very complete summary of the data down to that date. The only omission in regard to the North American forms that I have found, being the citation of *G. ancyliiformis* Pfr. from Palma Sola, Manatee Co., Fla., by Simpson in 1888 (Con. Ex., II, p. 96).

So far as I have been able to ascertain, no additional data in regard to our species have been published.

In the NAUTILUS for January, 1904, Dr. Dall called attention to a very interesting account by Nordinskiold of a septa-forming *Ancylus* from South America and expressed the opinion that the so-called *Gundlachia* are merely *Ancyli*, which under favorable conditions are able to protect themselves from drought and cold by forming an epiphragm and subsequently "to secrete an enlarged and somewhat discrepant shell."

The occurrence with typical *Gundlachia* of non-septate individuals indistinguishable in shell characteristics from *Ancylus* has been noted by several writers. Hedley, who believes the genus a valid one by reason of anatomical differences, apparently inclines to the view that "in unfavorable circumstances a septum is never formed." While Dr. Pilsbry (NAUT., IV, p. 48), speaking of this apparent co-existence of two forms, remarks, that if correct, "*Gundlachia* will furnish the most extraordinary case of dimorphism known among our American mollusks."

During the last few years I have had occasion to examine critically large numbers of our Eastern American *Ancyli*, and until within the last year, with the exception of a small series collected by Ferriss near Joliet (to be discussed later), I have discovered no tendency whatever to septa-forming in any instance.

Recently, however, material from Ohio, Indiana, Alabama and Mississippi has been received, which is of considerable interest as bearing on the question, and the evidence thus afforded is herewith submitted for consideration.

The examination of this material leads necessarily to a study of the described forms of North American *Gundlachia*, and the results of this work may properly precede the consideration of the new material referred to.

I.

Gundlachia stimpsoniana Smith. Plate IV.

This species was described in 1870 (Ann. N. Y. Lyc. N. H., IX, p. 399, fig. 6) from specimens collected in ponds at Greensport, Long Island, N. Y., and on Shelter Island. Only the "primary" stage was figured. It has not been found elsewhere, so far as I know.

Through the kindness of Mr. J. B. Henderson, Jr., I have been able to examine the original lot of this species from the Smith collection. It consists of 71 specimens from Greensport and 1 from Shelter Island.

The Shelter Island example is a young shell that has completed the septum and is similar to the one figured (figs. 10-12). The Greensport set may be divided into four groups:

1. 60 examples of the primary stage, with the septum in all stages of development, from the first beginnings at the posterior margin to the completed septum. With one exception, these specimens, although varying somewhat in size and shape, are similar in all other respects. The matured, or rather, perfected examples, vary from $1\frac{1}{2}$ to 2 mm. in length, $\frac{3}{4}$ to 1 in width and from $\frac{1}{2}$ to $\frac{3}{4}$ in height. The shape is an elongated oval, the ends bluntly rounded, the anterior extremity being usually somewhat more expanded. The sides are nearly parallel, usually somewhat constricted in the centre, and rather more so on the right than on the left, but in the smaller specimens are occasionally slightly convex. The apex is blunt, slightly projecting and inclined to the right. It is radiately striate as in *Ferrissia*. The anterior surface is distinctly ribbed with fine radiating ribs, which, however, do not extend to the apex. The septum for the posterior half or two-thirds is either flat or, more usually, slightly convex. From about the centre of the shell it is flattened and descends slightly to the aperture. This depression is, no doubt, caused by the body of the animal in moving in and out of the constantly decreasing aperture. The lines of growth are curved and delicate, but quite distinct. On completion of its growth the edge of the septum is abruptly turned upwards to the level of the edge of the shell, and the whole margin of the aperture thus formed is slightly

thickened and becomes continuous as shown in figure 11. The exceptional specimen noted above is noticeably larger, but proportionately more depressed than the other, measuring $2\frac{1}{2} \times 1\frac{1}{4} \times \frac{1}{2}$ mm. But in sculpture it is precisely the same, and I have no doubt that it belongs to the same species. In this, the septum is but partially developed. A very similar specimen in size and appearance, but without any appearance of a septum, is noted under group 2. Nearly all of these specimens are "amber-colored," as stated by Smith, but this is caused by a slight ferri-oxide deposit on the surface, which disappears on the application of oxalic acid, and leaves the whole shell of a clear, transparent, corneous color.

2. Five examples of the primitive stage with no trace of septum. Evidently that growth had not yet begun. Four of them are of the usual size and shape of the "primary" shell. The fifth is somewhat larger and, barring the lack of septum, almost a duplicate of the aberrant individual noted in group 1.

3. Three examples in which the secondary growth had been made without forming a septum. In all of them the primary stage is sharply defined by the difference of color, and in color and shape agrees substantially with the usual appearance at that period. In one of them (figs. 3, 6, 9) the posterior slope is not continuous externally, there being a well-marked "break" between the two stages of growth, and internally the secondary growth flares out at a decided angle all around the posterior margin of the primary shell.

In the other two examples, the primary shell is rather more contracted laterally than usual, but the secondary growth is, on all sides, in a substantially direct continuation of the primary shell. It becomes more or less irregular, however, as it progresses and the general effect of the entire shell is that of abnormal growth. None of these shells, however, are referable to any of the described species of *Ancylus*. Smith states that the Greensport *Gundlachia* were associated with *Ancylus fuscus* and with "more elevated specimens, probably belonging to another species." If his identification of *A. fuscus* was correct, the difference in the apical sculpture, to say nothing of the general contour of the shell, forbid the union of the two forms. What his other species were, must remain uncertain until his specimens can be examined. Possibly they were non-septate examples of "*stimpsoniana*," in which the line of demarcation between the primary and secondary growths was not so distinctly indicated as in these specimens, which he included with his *Gundlachia*.

4. Three examples having both a septum and a more or less complete secondary growth. Smith states that of about one hundred examples collected in the course of three years, only two were fully mature. Of the specimens now in the collection, only one is apparently mature, and that is much smaller than the dimensions given by Smith for the fully mature shell, *i. e.*, $5\frac{1}{4} \times 3\frac{1}{4} \times 1\frac{1}{2}$ mm. As shown by the figures (figs. 2, 5 and 8), it is somewhat defective along the left margin. Allowing for the broken edge it measures $3\frac{3}{4} \times 2\frac{1}{2} \times 1$ mm. In shape, however, it agrees substantially with Smith's description, and in the absence of a better, may be considered as typical.

The second specimen, if ever mature, has had the secondary growth broken back on all sides nearly to the primary shell, so that it is quite impossible to say what the original size or shape was.

The third example is apparently the one referred to by Smith (p. 400) as having begun the secondary growth with a septum covering "less than a quarter of the aperture." As shown by the figures (figs. 1, 4 and 7), it has been broken along the posterior margin, but enough remains to give a good idea of its original appearance. It measures $2.75 \times 2 \times \frac{3}{4}$ mm. If this is the specimen mentioned by Smith, and is "about two thirds" grown, the shell represented by figs. 2, 5 and 8 is not far from being fully matured. The shape of this specimen is quite different from that of the "typical" shell, owing probably to the difference in the size of the septum. The resemblance in outline between it and the non-septate specimen figured is quite strong, as shown by figures 4 and 6.

This species is apparently quite distinct from both *G. meekiana* and *G. californica*, being characterized by its larger and more widely-expanded secondary growth. More material showing the mature form is very desirable, and it is to be hoped that collectors resident on Long Island will make its rediscovery a matter of special consideration.

MOLLUSCAN FAUNA OF MONTEREY BAY, CALIFORNIA.

BY S. S. BERRY.

During the summer of 1906, the writer attended a six weeks' session of the Marine Biological Laboratory of Stanford University, at Pacific Grove, California. While there considerable attention was